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OPERATIVE TREATMENT FOR THE RELIEF OF  
CHRONIC SUPPURATIVE AFFECTIONS OF  
THE MIDDLE EAR: REPORT OF  
THREE CASES.<sup>1</sup>

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CHRONIC suppurative inflammation of the attic of the tympanic cavity may justly be considered a serious trouble. Especially is this true if the disease begins during childhood and continues for a long period. In many instances caries of one or more of the ossicles, is present, with or without disease of the bony walls of the attic, and the small space in the cavity is crowded with granulation-tissue or polypoid growths, causing defective drainage and consequently retention of septic matter. Exacerbations are in many cases frequent, and at these times the possibility of extension of the middle ear inflammation to the meninges of the brain or mastoid antrum is a constant source of danger. In the majority of instances the hearing power is practically gone, but a point of far greater importance is the danger to life itself. Indeed, a fatal termination is to be expected in a considerable number of these cases. In the light of what has been demonstrated within a few years, and realizing the possible effect of neglecting or ineffectually treating such a trouble, does it not seem somewhat surprising that the disease is allowed to progress unchecked when surgical interference has proved very successful in the majority of instances? The result of the operation has been either rapid cure or at least such improvement as to make the disease amenable to after-treatment.

I desire, therefore, to call attention to what has been done

<sup>1</sup> Read before the Boston Society of Medical Observation, March 7, 1892.



in aural surgery towards the relief of this class of almost hopeless cases. I believe it to be of general interest, for the rule of procedure is the common-sense surgical one of removing diseased bone or whatever obstruction is found to free drainage.

As far back as 1875, Dr. Kessel, of Jena, published the report of a case in which he removed the drum membrane, malleus, and incus.<sup>2</sup> He cited this case to show that the ossicles could be removed without danger. As to the pathology of the affection, Professor S. Moos, of Heidelberg, is of the opinion that the hammer is most frequently affected, and that often before caries can attack the anvil, it is exfoliated, being loosely held in place by the adjoining ossicles and tissues. The stapes is most rarely affected. He further states that he has never observed or seen described a case of primary caries of these bones; that the mucous membrane must first be diseased before caries can attack the ossicles.<sup>3</sup>

On July 20, 1886, Dr. Samuel Sexton, of New York, in a paper read before the annual meeting of the American Otolological Society, described "A New Operation for the Radical Cure of Chronic Purulent Inflammation of the Middle Ear Tract." Previous to that, a paper written by Dr. Schwartze, in 1885<sup>4</sup> gives a *résumé* of the literature of operations on the transmitting mechanism of the ear. Since that time the application of this line of surgery has developed very rapidly.

I have endeavored to summarize the results in the few recorded cases since Schwartze's paper in 1885; and I add the report of three cases operated upon by myself for chronic suppuration of the middle ear.

In 1887 Dr. Sexton reported nineteen cases of this disease, with results as follows: In five cases a cure took place in less than one month; in two cases, in two months; in two cases, in three months; in one case, in six months. In five cases, still under observation, there was slight improvement; in

<sup>2</sup> Archiv. f. Ohrenheilk., vol. xiii.

<sup>3</sup> Archives of Otol., March, 1885.

<sup>4</sup> Deutsche Chirurgie, Stuttgart.

three cases<sup>5</sup> still under observation, there was no improvement; in one case the treatment was not continued. He does not mention in any case the duration of the otorrhœa, except in a general way, that it had long continued. The malleus alone was removed in six cases and the malleus and incus in ten. He estimated that the hearing power was increased from 75 to 100 per cent. in the cases cured.

Dr. Burnett, of Philadelphia, before the American Otological Society last July, reported a case of seven years duration in which he excised the drum membrane and malleus. In thirteen days the discharge from the ear ceased. Three months from the time of the operation a cicatricial membrane was found over the promontory. No discharge. Hearing increased from nothing to whispered words at fifteen feet.

In my search for information as to the frequency of purulent inflammation of the superior portion of the tympanic cavity, I found, in a paper by Dr. Alexander Randall, of Philadelphia, "Notes on the Shrapnell Perforation,"<sup>6</sup> a total of 120 cases among ten thousand patients—somewhat small number. If, however, to this number is added those cases with perforation of the drum membrane, my impression is that the number would be largely increased.

From 1885 to 1890 inclusive, there were treated at the Massachusetts Charitable Eye and Ear Infirmary for chronic purulent middle ear disease 3,795 cases out of 21,818 patients applying for treatment. Among 8,337 of all cases seen in the last two years, from 1889 to 1890 inclusive, there were noted 1,020 patients with chronic purulent trouble, and of these 94 cases of perforation of the flaccid membrane,—almost 10 in every 100 cases. This is practically the same ratio per thousand for all ear patients as that reported by Dr. Randall, and illustrates the relative frequency of this affection in suppurative middle ear disease.

Although without statistics to substantiate any figures, my

5 In two of these cases suppurative inflammation seemed to continue in one because of caries of the acute, and in the other in consequence of the retention of the incus which could not be found.

6 American Otological Society, 1890.

memory leads me to believe that in a large proportion of the cases of suppuration, under my observation, the disease was confined to the attic or superior portion of the tympanic cavity. Most of the writers on this subject have advised the removal of the drum membrane together with the diseased ossicles. As the membrane forms a natural protector of the tympanic cavity I am impressed with the importance of exposing as little as possible of the mucous membrane to the effect of cold or what by chance may find its way into the ear. The cicatricial tissue closing the opening has been shown to form in many instances a vibrating surface capable of transmitting its movements to the stapes. Where the incus remains, its long process, through contact with this tissue, increases the hearing power, and in a measure also protects the delicate mucous membrane beyond. In my limited experience with this operation, but somewhat wider observation of the work accomplished by others, I have failed to find any evil effects which could be attributed to the operation, whereas the results obtained, both as regards effecting a cure and improving the power of hearing, have been extremely favorable. I believe that in all these cases every effort had been previously made in the way of both vigorous and mild treatment. I wish, however, in no way to be understood as advocating operative interference even when rough bone is demonstrated until the usual treatment has been thoroughly tried.

I might say in regard to the instruments necessary for the operation, that a series of triangular-shaped knives, bent at various angles, seemed sufficient for most of the tissues necessary to be separated. A case of Schwartz's curettes enables the walls of the attic to be cleared of granulation-tissue, great care being necessary in case of caries not to enter too far, the anatomy of the parts to be kept clearly in mind all the time. The ear must be perfectly illuminated, during the operation. In addition, a small pair of ear forceps for removing the completely excised ossicles is especially to be recommended, as it is more easily directed by the hand

and less likely to do harm by undue force. A small olive-tipped probe is very necessary in determining the location and extent of the disease. A small hook is also useful in finding any adhesions which may remain after the operation. They should all be separated before attempts are made to remove the ossicles. All antiseptic precautions were carefully observed. Cocaine has proved a valuable aid in clearing from bleeding the very small field of operation. For the steps in the operation there is little I can add to the description given by Dr. Kessel<sup>7</sup> or by Dr. Sexton.<sup>8</sup>

The house records of the following three cases occurring at the infirmary during my service for Drs. Green and Blake briefly illustrate what has been said:

CASE I. Mrs. M. F., forty-two years old. Has had a chronic, purulent discharge from the right ear for forty years, during which time it has never wholly ceased, considerable tinnitus. No pain, advised to enter the house for operation. Examination of the patient showed a slight discharge from the ear. Large perforation of the membrana tympani. Head of malleus rough to the probe and adherent to the promontory.

September 10, 1891. Patient was etherized and the malleus freed from all its attachments, which were very firm and dense around the head of the bone and handle, and then removed with forceps. The ear was thoroughly syringed with a corrosive sublimate solution (1 to 2,000), and tightly sealed with absorbent cotton and a collodion dressing applied. Examination of the malleus revealed caries of head and short process. Most of the manubrium had sloughed away.

September 14th. There had been no pain since the operation. Dressing removed for the first time. The ear was found absolutely free from all discharge. Evening temperature 99° for three nights, normal the rest of the time.

September 16th. Ear perfectly dry. Meatus kept closed with antiseptic cotton.

December 5th. At the end of nearly three months, middle

<sup>7</sup> Archiv. f. Ohrenheilk., vol. xiii.

<sup>8</sup> Transactions of the American Otological Society, 1886.

ear found dry and the mucous membrane white in color. Hearing greatly improved for conversation.  $W=2\frac{1}{2}$ . No tinnitus.

CASE II. Miss L. V., about fourteen years old. On November 11th, she entered the out-patient department for the relief of an otitis media suppurativa of the left ear, which had lasted for several years. Malleus was carious and had a large polypus growing from the handle. Bone very loosely held in place and partly destroyed by necrosis. Under ether, the malleus and polypus were removed with the snare and a few granulations in the upper part of the middle ear cavity were curetted. The meatus was then closed with cotton after being syringed with a corrosive sublimate solution (1 to 3,000). Evening temperature 100°.

November 12th. Considerable foul-smelling discharge from the ear. The patient was unable to bear the removal of the granulations so they were touched once a day with per-chloride of iron. Syringed with a 1 to 5,000 solution twice a day, and followed with instillations of resorcin and alcohol. Temperature 99°.

November 16th. Amount of discharge much less. Referred to out-patient department; since that time nothing has been seen of her.

CASE III. Miss L. C. B., thirteen years of age. Had been troubled with chronic purulent discharge from the left ear for ten years, at times annoyed with dizziness. Examination showed patient in poor general condition and anaemic; large destruction of the posterior segment of the drum membrane; malleus firmly adherent to the promontory; and the probe revealed a small spot of necrosis on the anterior edge of the handle of the hammer. Granulations were found covering an area of diseased bone on the inner wall of the middle ear cavity posterior quadrant.

October 1st. The patient was etherized, and an operation of half an hour performed. Malleus removed after some considerable difficulty, due to thick bands of tissue around the head of the bone. The granulations on the inner wall were curetted. Collodion dressing applied.

October 2d. Rallied from the ether well. Complained of some headache and slight pain in the ear. Temperature 99.8°.

October 3d. Dressing removed, and middle ear found filled with foul pus. Syringed three times daily, and powdered with iodoform. Evening temperature 99.5°.

October 5th. Discharge less. Slight headache and no pain in the ear. Temperature normal.

October 12th. Amount of discharge is very small. Ear wiped dry, and powdered once in two days.

October 17th. Ear perfectly dry in the superior portion. After omitting treatment for ten days, slight moisture only over spot of necrosis in lower portion of the tympanic cavity. No change in hearing.

January 2, 1892. Ear without discharge. No complaint of dizziness. Hearing the same as before the operation.

In CASE III healing was delayed by the condition of the bone concealed by the granulations on the inner wall of the tympanic cavity, although curetted as thoroughly as possible. All discharge disappeared from the attic in a few days after the operation. In contrast to this case is the one reported first, in which, in spite of the long continuance of the suppuration, the ear healed almost immediately after removal of the carious malleus. I think the two cases illustrate the two classes into which suppurative processes in the middle ear may be divided, considered from the point of time necessary for recovery after the operation. First, I would class as simple cases those in which necrotic bone is confined to one or more of the ossicles, the bony walls of the middle ear cavity being perfectly free from such a disease; second, as complicated, those cases in which some part of the bony wall, together with the ossicula, is diseased. The most speedy cure may be very naturally expected after operation in the first variety of cases, for the simple reason that everything interfering with recovery is removed. Experience has shown that the ears heal almost at once without subsequent treatment being necessary. In the second class of cases healing

is necessarily delayed, depending largely upon the seat of the diseased bone in the tympanum.

Removal of the ossicles and the membrana tympani will not cure every case of chronic otorrhœa; but I am certain that many may be cured and the rest relieved by operation. Of the cases mentioned in this paper (twenty-three in all,) twelve were cured in three months or less time; one in six months; five cases were improved; three cases were not improved and two passed from observation. As every variety of local treatment in most of the cases had previously been faithfully tried, it seems to me that the results of the operation have been most satisfactory, and that from the cases reported we may draw the following valuable conclusions:

- (1) The removal of the drum membrane and ossicles is attended with little annoyance to the patient, proof of which is sufficient to warrant the performance of the operation as the only means of cure in many cases.
- (2) The operation often produces marked improvement of the hearing.
- (3) Satisfactory results may be expected towards the relief of tinnitus and vertigo.
- (4) The results of the operation seem to be permanent.

Although not the chief purpose of this paper, I am tempted at this point to speak of operations on non-suppurating ears. The possibility of hearing well without the membrana tympani, malleus and incus has been successfully demonstrated in a number of cases; and this suggests what operative procedure may be expected to do in some cases of deafness due to hypertrophic catarrh of the middle ear without fixation of the stapes. The distressing symptom of tinnitus has been relieved by the same operation. It has also been done with success in certain cases of disturbance of equilibrium from pressure transmitted through the middle ear. There are a few cases recorded in which the hearing has been in good part restored by removal of the membrana tympani and one or more of the ossicula. The successful operations have, however, been as yet too few to enable us to establish a rule.

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